SUBMISION TO THE TRAVESTON DAM SENATE INQUIRY

'AN APPRAISAL OF THE ECONOMIC ISSUES SURROUNDING THE TRAVESTON PROPOSAL'

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INTRODUCTION

This submission has the approval and acceptance of the WideBay Burnett Conservation Council Executive Management Committee. Roger M Currie is the Water Resources Project Officer for the council and was regional coordinator from March 2004-March 2007.

ABSTRACTs

CBA (Costs Benefits Analysis) is one form of economic appraisal for investigating the potential costs and benefits, which may occur as a result of public investment in water storage infrastructure projects.
CBA can give an indication of the distribution of the costs and benefits of a project at the regional scale, by calculating the amount of foregone benefits (opportunity losses) from any potential economic gain of a resource use . It can also calculate the relative direct economic costs from the imposition of the project at the regional scale.

An application of CBA to the proposed Traveston Dam, using Queensland government accepted data from the Paradise Dam CBA 2001[1], reveals that the Traveston Dam proposal will equate to an annual economic opportunity loss to the Mary regional economies of $ Aus 360 M, if the entire projected annual yield of 70,000mgl is allocated to the Brisbane region for urban & industrial use.
If a gross margin of $1126 per Mgl is applied for lost agricultural opportunity in the catchment, the annual cost to the regional economies would be $Aus 307M.

The CB ratio of the project is calculated to be 0.55 for urban & industrial use from opportunity loss, and 0.88 for agricultural use. CBA methodology recognizes that projects which result in a ratio greater than 1, are generally considered to be economically feasible and a suitable investment of public monies.

INTRODUCTION

This submission should be considered as an attempt to present an open, transparent and objective analysis of the economic costs and benefits of the proposal. The author makes no claim of economic expertise. The methodology is based on the methodology used by the NECG 2001 economic report for the Burnett River Dam (Paradise Dam), which was

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[1] www.burnetwater.com/paradise/appendixe

used as an economic justification for demonstrating the economic benefits and costs of that project.

The author considers that the regional, economical, geographical, social and environmental issues surrounding the proposed Traveston Dam are not dissimilar, to the Paradise Dam, given that both river systems share similar Endangered & Vulnerable species, similar geological patterns, similar climate conditions and similar agricultural based economies.

The analysis has used data listed in the NECG 2001 report.

The Mary catchment is impacted by variable rainfall and prolonged periods of drought. It also suffers from amongst the highest levels of unemployment and the lowest levels of Income in the State.

1 Introduction
1.1 The Mary region

 Development of water infrastructure is one of the instruments being used by the Queensland Government to facilitate regional development and with it, wealth and job creation.
The development being considered on this occasion is focused on the Mary River catchment and would involve the construction of a dam at Traveston Crossing. The additional yield created would be used for industrial expansion & urban use in the Brisbane catchment.

The Mary catchment has been characterized by:
§ Particularly variable rainfall and prolonged periods of drought;
§ High levels of unemployment;
§ Low income levels; and
§ Relatively high levels of surplus capacity.

The convergence of these factors means that the development of water infrastructure can provide a particularly effective vehicle for simultaneously addressing these circumstances additional supplies of water have the potential to generate wealth and create new jobs in a populated part of regional Queensland.

Consequently, development of the water resources of the Mary River catchment is seen as a particularly attractive option for South East Queensland.

2 Overview of the Mary Region
2.1 Introduction
The Mary region has exhibited many characteristics that high unemployment
§ Labour force issues and employment;
§ Income and economic growth; and
§ Population.

The key point is that the economic performance of the Wide-Bay region has failed to converge towards the rest of the Queensland economy, as standard economic theory would suggest. This indicates that the area is lacking sufficient drivers of growth, particularly in terms of infrastructure, both physical and social, and in a sufficiently strong export base. A sufficient driver of regional growth would be the allocation of the annual yield to the Mary region and not the Brisbane catchment.

2.2
Labour force and employment
The Wide Bay Burnett Region exhibits the twin labour market problems of:
§ High unemployment rates; and
§ Low labour force participation.

For example, the twelve-month average to August 2001, the all-persons average unemployment rate for the Wide Bay Burnett Region was 12.7%, among the highest of any region in Australia. This compared with 8.3% for Queensland as a whole. 1 Taken over the period 1987-2001, the underlying level of unemployment (Figure 2.1) appears relatively stable with a slight (although not statistically significant) upward trend. 1 Another comparison can be made based on the Comparative small area unemployment data supplied by the Department of Employment Workplace Relations and Small Business (DEWRSB) - which showed significantly higher unemployment rates for the Wide Bay- Burnett region compared to Queensland as a whole (14.8% compared to 8.9%) for the March 2001 quarter.
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Unemployment Rate in Wide Bay-Burnett:
September 1987 to August 2001

Figure 2.1   Unemployment rate in Wide Bay Burnett: September 1987 to August 2001
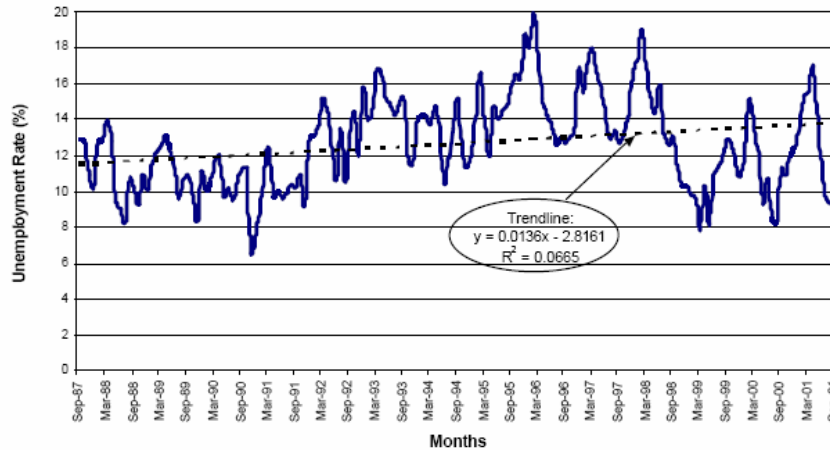
Source: Australian Bureau of Statistics

In addition, the region performs poorly relative to the Queensland average in relation to the following:
§ Lower percentage of full-time jobs (69% compared to 72%)
§ Higher percentage of part-time jobs (31% compared to 28%)
§ Lower participation rates for both sexes; females (47% compared to 57%) and males (62% compared to 73%).
Of the 390,800 net new jobs created in Queensland over the period 1991-2001, 5,300 were created in Wide-Bay Burnett. This was little more than a quarter of the region's expected share (based on actual percentage in 1991) over the period (21,100) and indicates that the region declined in relative importance as a source of jobs in Queensland.

The job performance in Wide Bay Burnett is a direct function of its current industry structure (industry mix) with an under performing agricultural and other primary industry sector and a relative under-development of services.

The Wide-Bay Burnett region had 6.6% (174,898) of the State's Population aged 15 years and over at the time of the 1996 Census of Housing and Population. Among this group there is some indication of below state average performance in education and training attainment:

§ 22.4% left school at 14 years or below was compared to a State average of 15.4%;
§ 14.8% possessed some form of vocational qualification (either basic, skilled or associate diploma level) compared with 15.6% for the State as a whole; and
§ 33.1% of the regional population 15 years and above had post-school qualifications

compared to a Queensland percentage of 38.5%. Taken overall the data indicate a relative skill and educational disadvantage for the region.

2.3 Income levels
Income levels in the Wide Bay-Burnett region are also low relative to State average. For example, according to the 1996 Census, over 80% of the region had average weekly incomes below $500 compared to a State average of $654.80 (ABS C-Data 1996 Census Database 1997).
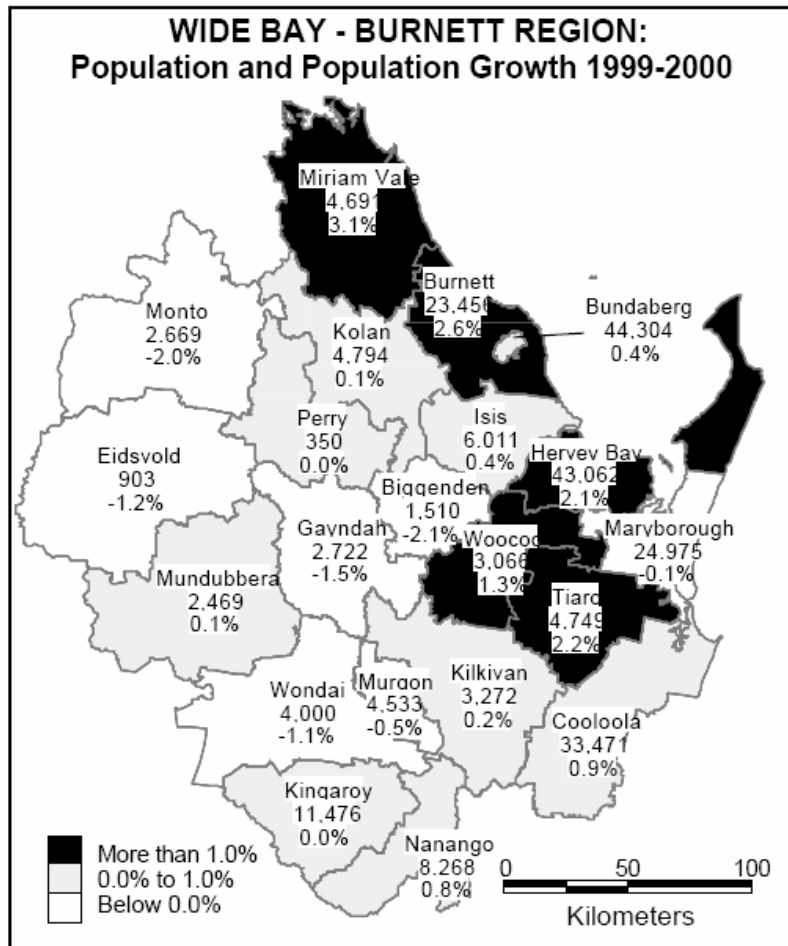This merely confirms the region's status as one of the lowest average income areas as revealed through the 1981 and 1986 Census statistics.
Similarly the Bureau of Rural Science found that incomes in the Wide Bay-Burnett region were between 10-20% below the rural average across Australia. Average rural incomes were over 13% below metropolitan averages.2 Similarly, the ratio of benefits received to tax paid in the Burnett region is much higher than the Queensland average, again indicating a weak and highly dependent economy producing low incomes.

2.4 Population
The Wide Bay-Burnett Statistical Division has a total area of 52,301 square kilometres 3.0% of the State's Total area) and incorporates 21 local Government areas. The region's estimated population at 30 June 1999 was 234,751 persons that grew at an annual rate of 1.1% for the 4- year period June 1996-June 2000. The population increased by 2,126 persons between June 1999 and June 2000 with the largest regional increases occurring in Hervey Bay City (41.7% 2 Bureau of Rural Science, (2001) *Country Matters: Social Atlas of Rural and Regional Australia* 8 October 2001 Page 14 of 14
of all growth) and Burnett Shire surrounding Bundaberg City (28.1% of all growth). Cooloola Shire (excl. Gympie) also increased over the year (15.5% of all growth in the region). The outer Shires of Biggenden, Eidsvold, Gayndah, Monto, Murgon, Perry and Wondai experienced either no population or small population decreases.

Figure 2.2   Wide Bay Burnett region: population and population growth 1999-2000

WIDE BAY - BURNETT REGION:
Population and Population Growth 1999-2000

Miriam Vale
4,691
3.1%

Monto
2,669
-2.0%

Burnett
23,450
2.6%

Bundaberg
44,304
0.4%

Kolan
4,794
0.1%

Perry
350
0.0%

Isis
6,011
0.4%

Hervey Bay
43,062
2.1%

Eidsvold
903
-1.2%

Biggenden
1,510
-2.1%

Gayndah
2,722
-1.5%

Woocoo
3,066
1.3%

Maryborough
24,975
-0.1%

Mundubbera
2,469
0.1%

Tiaro
4,749
2.2%

Wondai
4,000
-1.1%

Murgon
4,533
-0.5%

Kilkivan
3,272
0.2%

Cooloola
33,471
0.9%

Kingaroy
11,476
0.0%

Nanango
8,268
0.8%

More than 1.0%
0.0% to 1.0%
Below 0.0%

0   50   100

Kilometers

ce: ABS 3218.0 Regional Population Growth 1999, 2000

Source: ABS 3218.0 Regional Population Growth 1999, 2000

2.5 Summary
Overall the picture is one of a regional labour market that has not grown as strongly as other areas of the state, either in terms of participants or job creation. Part of the reasons behind this are a narrow industry base, in particular, spare capacity in agriculture, relative underdevelopment in services, slower levels of population growth in most areas and higher concentration of demographic groups that traditionally experience labour market difficulties and lower overall levels of post-school qualifications.

The economic performance of Wide-Bay region has failed to converge towards the rest of the Queensland economy, as standard economic theory would suggest. This indicates that the area is lacking sufficient drivers of growth, particularly in terms of infrastructure, both physical and social and in a sufficiently strong export base.

The removal of water resource in the form of the projected annual yield of 75,000 mgl from the stage one construction at Traveston, will likely further restrict the regions economic growth potential.

BENEFITS

The project is capable of producing AUS$140M of direct benefit from the use of the 70,000mgl for urban & industrial applications in the Brisbane region, there is aso likely to be an assumed local annual benefit derived from the construction and associated economic expansion , of AUS$4M. Total annual benefit is then assumed to be AUS $144M.

CAPITAL COST
The indicated capital cost of the stage one construction has been stated to be $AUS 1700M [2] , this figure has been supported by media statements from both the Premier and Deputy Premier.

OPERATING AND DISTRIBUTION COSTS

There are two major sources of ongoing costs of the water supply provided by the Infrastructure:
§ operating costs of the storage facilities; and
§ Delivery costs.

Operating costs for the storage facilities are assumed to be as follows:
§ Operating costs of $250,000 per annum for the Traveston Dam stage one
§ Environmental monitoring costs plus impact mitigation measures of $500,000 per annum .
§ Maintenance costs of $500,000 every 10 years .
§ Dam safety costs of $100,000 every 20 years (dam safety review) and $10,000 every 5

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[2] Email response from MS Stephanie Wilson QWI pty ltd 30th Jan 2007

years (inspections) § overhead and billing costs of $25,000 per annum .

DELIVERY COSTS
Construction of a 100km pipeline and pumping stations is assumed to be AUS $160M and annual pumping costs are assumed to be AUS $5M [3]

DIRECT COSTS

Annual water treatment costs for the 70,000mgl is assumed to be AUS$42M [4]
Annual agricultural production loss form the dam footprint is assumed to be AUS$10M
Annual economic loss to the commercial fisheries and the tourism industries of the Great Sandy Strait is assumed to be in the order of AUS$10M[5]

PROJECTED OPPORTUNITY COSTS
Agricultural production gross marginal returns per MGL of irrigated production, for the region have been calculated as follows:

The potential gross marginal returns for agricultural production within the Mary catchment[6] are listed in Table 1 .

An average gross marginal return is $2270 MGL ,this average gross marginal return figure equates to cost of $ of foregone production , if a conservative return figure of $1126 is used, (to account for market elasticity) this would equate to a loss or 'cost of foregone production' to the catchment of $AUS 78.82M per annum as the 70,000 MGL is to be piped to Brisbane.

Mary Catchment Gross Marginal Returns Agricultural Production

Industry	gross mgl returns $	MGL YIELD	Total opp loss	$AUS	Conservative	X	
Dairy	500						
Cane	250						
Fruit & nuts	1600						
Vegetables	2000						
Intensive feed	7000						
Average	2270	X 70,000	Total opp loss	158.9M	AUS$ 1126	70,000	AUS$78.82

[3] GHD 2006 (SEQ INFRASTRUCTURE REPORT) , GHD/KINHILL 1992.

[4] Kinhill 1992 , average LGA cost of AUS$600/MGL.
[5] Assumed 10% reduction on annual economic benefit . OESR 2007.
[6] Figures have been extrapolated from the NECG 2001 CBA for Paradise Dam ,
www.burnettwater.qld.gov.au/paradise/appendixl

Urban & Industrial	2000	X 70,000	Total opp loss	AUS$140M

Table 1 , Mary Catchment Gross Marginal Returns Agricultural Production.

Average gross marginal returns for urban and industrial use are calculated at AUS$2000.00

Discount rates

The Queensland Treasury publication entitled *Guidelines for Financial and Economic Evaluation of New Water Infrastructure in Queensland* indicates that for cost benefit analysis a 6% real discount rate ought to be applied. Whilst the analysis has been performed using this discount rate, the author believes that there is good reason to suggest that it is excessive for the purposes of this exercise.
Discount rates for cost benefit analysis are normally determined by considering alternative patterns of consumption through time.

 In other words, the discount rate reflects society's willingness to trade future for present consumption. The best measure of this is arguably the risk free rate of interest. The risk free rate can be approximated by the discount rate implied by yields of long-term Commonwealth bonds.

The longest traded nominal bonds are of approximately 10 years' duration. However, Treasury Capital Indexed Bonds, which adjust the capital value of the bond in line with the consumer price index, are even longer-term bonds (up to 20 years). Since January 1998, real rates implied from the yield of Treasury Capital Indexed Bonds (which provide the best indication of the real risk free rate) have been in the vicinity of 3.5%.30

[27]   The financial analysis requirements set out in section 6 of the *Guidelines for Financial and Economic Evaluation of New Water Infrastructure in Queensland* will be addressed in a further report to be completed during 2001.

On 28 September, 2001 yields on Treasury Indexed Bonds were as shown in Table 4.1.

Table 4.1   Treasury Capital Indexed Bonds

Coupon	Maturity	Real Yield (% p.a.)
4.00%	Aug 2005	2.845
4.00%	Aug 2010	3.345
4.00%	Aug 2015	3.425
4.00%	Aug 2020	3.445

Source Reserve Bank of Australia www.rba.gov.au

In technical terms, the appropriate discount rate is the consumption rate of interest which is the utility discount rate plus the elasticity of the marginal utility of consumption times the consumption growth rate. The relevant factors for consideration are therefore the rate of economic growth, the elasticity of the marginal utility of consumption and utility discount rates (see Ekstein, O. (1957) *Investment Criteria for Economic Development and the Theory of Intertemporal Welfare Economics* Quarterly Journal of Economics).

Whilst rates have been higher in previous years, they have rarely exceeded 5% since 1995.

To demonstrate some acceptable sensitivity, the analysis has been carried out with various discount rates ranging from 4% to 10%.

Table 1 indicates the Discounted CBA for Urban & Industrial use of the projected annual yield.

TRAVESTON DAM CBA
AUS$M

YEAR	Benefit	cost	ANNUAL DISCOUNT RATE PV	0.04 NPV	0.06 NPV	0.08 NPV	0.1 NPV
$1.00	0	1,700	$1,700.00	1,634	$1,603.00	$1,574.00	$1,545.00
2	144	368	-224	207	197	190	184
3	144	368	-224	$197.12	186	177	168
4	144	368	-224	190	177	164	152
5	144	368	-224	184	164	152	139
6	144	368	-224	177	152	141	125.44
7	144	368	-224	168	148	129	114.24
8	144	368	-224	164	139	121	103
9	144	368	-224	157	132	112	94

10		144	368	-224	150	123	103	85
11		144	368	-224	143	116	94	78
12		144	368	-224	134	110	87	69
13		144	368	-224	128	103	81	63
14		144	368	-224	123	99	76	58
15		144	368	-224	119	92	69	52
16		144	368	-224	114	87	65	47
17		144	368	-224	110	83	60	43
18		144	368	-224	105	78	$56.00	38
19		144	368	-224	100	74	52	36
20		144	368	-224	96	69	47	31
21		144	368	-224	95	65	43	29
22		144	368	-224	90	60	40	27
23		144	368	-224	87	58	38	25
24		144	368	-224	83	54	34	22
25		144	368	-224	84	52	31	20
26		144	368	-224	81	50	30	19
27		144	368	-224	78	49	28.42	17
28		144	368	-224	75	46	26	$15.40
29		144	368	-224	$72.00	$41.48	$25.80	14
		4,032	12,004		$3,510.40	2,805	2,273	1,869
CB RATIO		$0.51	0					

Table 1 , Discounted sensitivity analysis for Traveston stage 1 .

Table 2 contains the discounted CBA for opportunity loss from agricultural use.

70,000 MGL AGRIC PRODUCTION OPP COST

YEAR	BENEFIT	COST(AG USE)		PV	NPV@4%	NPV@6%	NPV@8%	NPV@10%
1	0		1,700	1700	1634.6	1598	1564	1530
2	144		307	-163	$149.96	$143.44	$138.55	$128.77
3	144		307	-163	143.44	135.29	128.7	122.25
4	144		307	-163	138.55	128.77	118.99	110.8
5	144		307	-163	133.6	120.62	110.84	101.06
6	144		307	-163	128.77	114.1	102.69	91.28
7	144		307	-163	122.25	107.58	94.5	83.13
8	144		307	-163	118.99	101.06	88.02	74.98
9	144		307	-163	114.1	96.17	81.5	68.46
10	144		307	-163	109.211	89.65	74.98	61.94
11	144		307	-163	104.32	84.76	68.46	57.05

12	144	307	-163	101.06	79.887	63.57	50.53
13	144	307	-163	97.8	74.98	58.68	47.27
14	144	307	-163	92.91	71.72	55.42	42.38
15	144	307	-163	89.65	66.83	50.53	37.49
16	144	307	-163	86.39	63.57	39.44	34.23
17	144	307	-163	83.13	60.31	44.01	30.97
18	144	307	-163	79.87	57.05	40	27.71
19	144	307	-163	76.61	53.79	37.49	26
20	144	307	-163	73.035	50.53	34.23	22.82
21	144	307	-163	70.09	47.27	30.97	21.19
22	144	307	-163	68.46	44.01	29.34	19.56
23	144	307	-163	65.2	42.38	27.71	17.93
24	144	307	-163	63.57	32.6	24.45	16.3
25	144	307	-163	60.31	37.49	22.28	14.67
26	144	307	-163	58.8	36.22	21.1	13.6
27	144	307	-163	56.5	33.4	20.6	12.44
28	144	307	-163	54.5	31.9	18.95	11.3
29	144	307	-163	52.4	30.13	17.5	10.2
	4,032	8,596		$2,593.48	$2,035.51	$1,643.50	$1,356.31

CBA
RATIO   0.88

Table 2 Discounted sensitivity CBA for Traveston stage 1.

CONCLUSION

From this CBA it is seen that the should the entire 70,000mgl projected annual yield be allocated to the Brisbane region, the Mary Catchments economies stand to incur a substantial annual economic loss. This analysis has not attempted to calculate in economic terms , the potential ecological losses to the region , the potential indicative economic values of the Great Sandy Ramsar Wetland have been calculated to be in the vicinity of AUS$3B[7].
It can also be demonstrated that the CB ratio of the project fails to reach a figure which can be seen to be considered as a suitable investment of public monies.
The issue of planning a project which has the potential to impose major economic costs to the immediate region begs the question of equitable costs and benefits sharing.

It is widely recognized that large dams create significant benefits from water storage, but they also create significant costs as demonstrated here, the question of compensation for those who will carry the costs of the project must be investigated, to demonstrate adherence to regional democratic planning, public consultation and decision making.

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For & on behalf of
Wide Bay Burnett Conservation Council

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[7] Indicative Economic Values for the Great Sandy Ramsar Wetland , WBBCC 2007.

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